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CAMPBELL'S "CIRCULAR NOTES"

My Circular Notes. Extracts from Journals, Letters sent home, Geological and other Notes, written while Travelling Westwards round the World, from July 6, 1874, to July 6, 1875. By J. F. Campbell, Author of "Frost and Fire." 2 vols. (London: Macmillan and Co., 1876.)

ALL who are acquainted with the undoubted merits of Mr. Campbell's earlier work—merits to which not even the most serious and glaring defects in style, matter, and arrangement can render us insensible—will hail with pleasure the appearance of this latest production of his ever lively pen and amusing pencil. We cannot but think that in this, his second venture, the author has greatly profited by some of the severe but not unfriendly criticisms which were elicited by the publication of his first work. Mr. Campbell has, in "My Circular Notes," avoided the grave mistake of mingling together in wild confusion humorously-written notes of travel and sober arguments on difficult scientific questions; and he has exercised, as we think, a very wise discretion in relegating to an appendix the discussion of that important geological problem, the hope of solving which seems to have been his main incitement to undertaking this journey round the world. In perusing this scientific portion of his book, with which of course the readers of NATURE are principally concerned, we are happy to find far fewer examples of that looseness and inaccuracy of language and to miss that dogmatic tone and redundancy of illustration which were the conspicuous blemishes of the author's earlier work. And all these improvements have we think been effected, without any sacrifice of his really graphic and vigorous style of writing upon scientific questions.

Before proceeding to notice the purely scientific portion of "My Circular Notes," we must remark that, even those who care nothing about the geological problems discussed in it, will find very much to interest them in this most lively and amusing record of travels. Those who would realise the curious scenes which may be witnessed in the Western States of North America, where the most volatile elements of old nationalities are uniting to form a new community—those who take interest in that wonderful social experiment which is now being tried in Japan, no less a one than the transplanting, bodily, of the full-grown civilisation of the West among the most conservative races of the East—and those who desire to learn something of the relics of the ancient nations, languages, folk-lore, and creeds of Ceylon—cannot do better than accept the guidance of Mr. Campbell. In him they will find a most vivacious and ever-amusing companion. Yet, on the other hand, his digressions upon such subjects as emigration and the struggle of races, and his treatment of questions like the relationships of languages and the origin of myths, will sufficiently prove that he has thought earnestly upon many social and philological problems, and has aimed at something higher than merely writing a diverting book of travel.

In adopting the method of loosely stringing together extracts from his journal with private letters, and making no attempt to weld them into a consecutive narrative, our author certainly trespasses somewhat upon the indulgence of his readers. This disadvantage is perhaps in some degree compensated for, however, by the freshness and vigour of his descriptions and reflections, appearing as they do, just as at first dashed off in the presence of the strange scenes which inspired them.

The problem on which the author of this work has sought to throw light in making this journey round the world is one of considerable interest to geologists at the present time. In 1840 Agassiz brought forward evidence which soon convinced even the most sceptical that, not only did the glaciers of the Alps at one time extend far beyond their present limits, but that many districts—such as parts of our own islands, for example—which are now entirely devoid of glaciers, must once have been subjected to the powerful erosive action of moving ice. The idea was at once taken up by Buckland, Lyell, and other observers in this country, who showed that the new "Glacial theory" afforded a complete solution of what had hitherto constituted some of the most difficult and perplexing problems of geology.

By some later authors, however, the "Glacial theory," which had soon met with all but universal acceptance, was pushed far beyond those limits which geological observation warranted. It was asserted that, not only did the existing rock-surfaces of the more northern regions of the earth owe some of their later touches to the erosive action of glaciers, but that many even of the grandest valleys and the deepest lakes were entirely scooped out by their agency. Some even went farther than this, and declared that the whole region around either of the poles must at one period have been enveloped by continuous sheets of solid ice ("ice-caps") which extended far into temperate and even tropical latitudes. They maintained, in opposition to the arguments of Lyell, that no changes in the distribution of land and water on the earth's surface could possibly account for the former extension of glaciers, and they invoked the aid of some astronomical cause to account for the alleged phenomena. A few waxed even bolder than this, and insisted that they had found evidence, which warranted them in believing in the regular recurrence, during past geological time, of alternating mild and glacial periods; and several rival astronomical theories were even suggested to account for these supposed rhythmical changes in climate.

Among the foremost of the champions of these extreme views appeared the author of the present volumes. In 1873, he read before the Geological Society a paper in which he attributed the production of the whole valley system of Ireland to the erosive action of a polar ice-sheet. The remarks elicited from several geologists during the discussion of this paper appear to have induced Mr. Campbell, who, during his travels in Scotland, Norway, Iceland, North America, &c., had acquired great skill in recognising the peculiar marks produced by glacial action, to extend the limits of his observations by a journey right round the continent of Europe. What he then saw led him so far to distrust his former conclusions concerning the existence of a universal glacial period and a polar ice-sheet, that he determined to put the question to the severest test possible, by a complete tour of the globe.

Mr. Campbell's mode of arguing this question is as

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follows :—At the present time glaciers enter the sea, within the northern hemisphere, down to the latitude of 60°; the sea is frozen and ice-marks are produced on the shore as far south as 40°; and icebergs drop their rocky burdens within 37° degrees of the equator. If there ever prevailed a universal glacial period with a general reduction in the temperature of the whole northern hemisphere, we ought to find traces of glacial action everywhere round the whole globe and extending even to more southern latitudes than 37°. If the ice-cap "ever existed, the marks of it ought to be found on all meridians alike. If ever there was a glacial period in our world, glacial marks ought to be found everywhere, in the same latitudes and at the same levels, in the same state of preservation."

Keeping these premises constantly before his mind, our author found, during his journey of eleven months, quite sufficient evidence to cause him to make a full retraction of his former conclusions on the subject. As far as Chicago he observed everywhere the most striking traces of former glacial action; but in the same latitudes to the westward he found these marks of old glaciers entirely disappearing; and although some signs of glacial action were detected in the Rocky Mountains themselves, yet from this great range onwards to Ceylon they were found to be wholly wanting. Mr. Campbell's previous expedition in eastern Europe had led him to conclusions as to the *local* character of glacial action which were quite in harmony with those obtained in this journey round the globe, and he enunciates the results of his latest observations upon the subject as follows :—"Whether I take marks which can be explained by glacial erosion, such as firths, valleys, lakes, &c., or marks which clearly are not glacial, such as peaks and canons, I find nothing to suggest a general glacial period in America or in Europe;" and he further proceeds to state that he can find no evidence whatever of a recurrence of universal glacial periods such as might result from the action of some astronomical cause.

We have already extended this notice of Mr. Campbell's valuable work to the farthest limits, and must refer to the book itself for the details of the evidence on which his conclusions are founded.

In bringing our remarks to a close, we may add that the author's present views on the influence produced on climate by the changes of level in different districts, resulting in alterations in the direction of ocean currents, &c., appear to be quite in harmony with those so long and firmly maintained by Lyell, in opposition to the cosmical theories of the extreme glacialists. His observations on Western North America are fully confirmed by the more detailed examination of the districts by several of the United States' geologists; and his conclusion that there is no evidence of the former existence of a general "Glacial period" are quite in accordance with those enunciated by Dr. Hector and other observers who have studied the glaciers of the southern hemisphere. Prof. Nordenskjöld has, moreover, shown how completely palæontological evidence of the clearest character disposes of the notion of frequently recurring glacial epochs in past geological times.

We cannot but admire the candour with which Mr. Campbell renounces his previously-expressed opinions; and we may, perhaps, be allowed to express a hope that the facts and arguments which have led him to so greatly modify his views on glacial phenomena, will not be without effect on the minds of others, who, like him, have certainly pushed their conclusions derived from a study of very limited portions of the earth's surface, to generalisations far beyond what those observations can be legitimately made to support.

J. W. J.

SCLATER'S "GEOGRAPHICAL ZOOLOGY"

On the Present State of our Knowledge of Geographical Zoology. By P. L. Sclater, M.A., F.R.S. Being the Presidential Address delivered to the Biological Section of the British Association. (London, Printed by Taylor and Francis: 1875.)

WE have received a copy of Mr. Sclater's address as President of the Biological Section of the British Association, at its meeting last year, at Bristol. At the time when it was delivered we had the opportunity of presenting it in full to our readers (*vide* NATURE, vol. xii. p. 374, *et. seq.*). In the independent form now under notice it has added to it a most important appendix, namely, a list of all the works and memoirs referred to in its various sections. When we say that these are more than 420 in number, a fair estimate may be formed of the labour which must have been involved in their collection and classification. Exact references are a most valuable aid to biological research, and prevent the waste of much time during special investigations, and on the subject of the geographical distribution of vertebrated animals, this address of Mr. Sclater's supplies all that can be wanted by anyone either reviewing the subject as a whole, or desiring to obtain the best information on the zoology of any special locality.

The arrangement adopted is regional, the basis being the universally accepted divisions proposed by Mr. Sclater himself. They are thus tabulated :—

I.—Palæarctic Region . .	*Arctogaea.*
II.—Ethiopian Region . .	
II*a*.—Lemurian Sub-region .	
III.—Indian Region . . .	
IV.—Nearctic Region . . .	
V.—Neotropical Region . .	*Dendrogaea.*
V*a*.—Antillean Region . .	
VI.—Australian Region . . .	*Antarctogaea.*
VII.—Pacific Region	*Ornithogaea.*

Each of these regions is divided into sub-regions, which are described separately. Perhaps no better idea can be formed of the extent to which the greater divisions of the globe have been studied, than by a comparison of the number of works and memoirs which have appeared with reference to each, or to parts of each. As might be premised, there has been much written on the animals of the Palæarctic region, considering that it includes Europe, together with North Africa, Siberia, and North China. There are 119 references with regard to it, the most recent including Prof. Lilljeborg's work on the Mammals of Sweden and Norway, Mr. Dresser's "Birds of Europe," Mr. J. Hancock's "Birds of Northumberland and Durham," Dr. Schreiber's "Herpetologia Europaea," the German translation of Dr. N. Severzow's work on the Birds of Turkestan, the late Dr. Stoliczka's "Avifauna of Kashgar in Winter," Lieut.-Colonel Irby's "Ornithology of the Straits of Gibraltar," and the new edition of Bell's "British Quadrupeds."

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